

What is claimed is:

1. A fused silica soot production furnace comprising:  
a precursor delivery system for delivering silicon containing precursor to the furnace;  
a burner for producing a flame and converting the precursor into a silica-containing soot; and  
a crown constructed from a foamed refractory material having a network of interconnected pores.
2. The furnace of claim 1, wherein the pores in the foamed refractory material have a surface area greater than  $0.5 \text{ m}^2/\text{g}$ .
3. The furnace of claim 2, wherein foamed refractory material has a porosity greater than 50%.
4. The furnace of claim 2, wherein the foamed refractory has a density less than  $1.5 \text{ g/cm}^3$ .
5. The furnace of claim 2, wherein the foamed refractory contains iron and sodium impurities less than 10 parts per million.
6. A method of manufacturing a fused silica boule comprising the steps of:  
providing a furnace including crown constructed from a foamed refractory material having a network of interconnected pores; and  
introducing a silicon-containing precursor into a flame to produce fused silica particles, collecting the particles on a collection surface and consolidating the particles on the collection surface to form a boule.
7. The method of claim 6, wherein the pores in the foamed refractory material have a surface area greater than  $0.5 \text{ m}^2/\text{g}$ .

8. The method of claim 7, wherein foamed refractory material has a porosity greater than 50%.
9. The method of claim 7, wherein the foamed refractory has a density less than 1.5 g/cm<sup>3</sup>.
10. The method of claim 7, wherein the foamed refractory contains iron and sodium impurities less than about 10 parts per million.